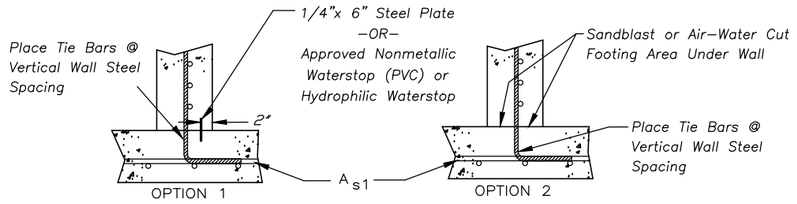
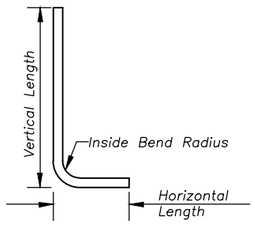
RING FOUNDATION

Footing Dimensions and Steel						
Wall Height H	Tank Diameter D	Footing Width B	Footing Depth hf	Overhang Cext	Radial Steel As1	Ring Steel As2
8 ft.	all	30 in.	10 in.	12 in.	Place As1 at vertical wall steel (Asv) spacing. For spacing greater than 9 inches use #5 bars, otherwise use #4 bars (#5 bars could be replaced with #4 bars at 1/2 Asv spacing).	#4 @ 8 in.
10 ft.	all	36 in.	12 in.	14 in.		#4 @ 6 in.
12 ft.	all	48 in.	12 in.	14 in.		#4 @ 6 in.
14 ft.	all	60 in.	12 in.	15 in.		#4 @ 6 in.

1. For tanks 10 feet and deeper, required soil bearing pressure shall be at least 2,000 psf. Tanks less than 10 feet require 1,500 psf.
2. Place ring steel 3 inches above the footing bottom.
3. Place radial steel on top of ring steel.



WALL TO FOOTING CONSTRUCTION JOINT OPTIONS



BAR DIMENSIONS

Bar Size (1)	#4	#5
Vertical Length	26 in.	29 in.
Horizontal Length	8 in.	11 in.
Inside Bend Radius	1–1/2 in.	1–7/8 in.
Total Length	34 in.	40 in.

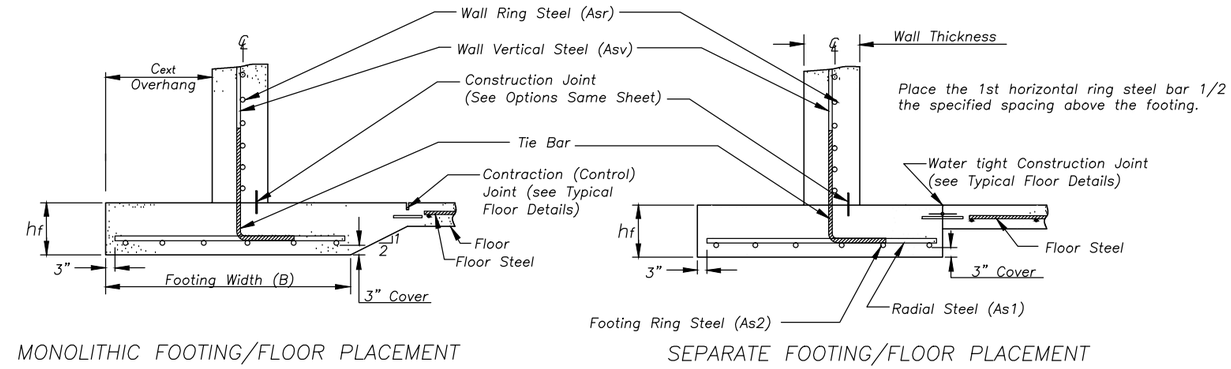
(1) Use the same bar size as Asv

TIE BAR CONFIGURATION

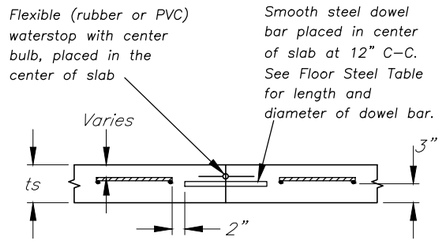
WALL STEEL REINFORCEMENT

Wall Height	8 ft. (8" thickness)				10 ft. (8" thickness)				12 ft. (10" thickness)				14 ft. (10" thickness)			
	Ring Steel Asr		Vertical Steel Asv		Ring Steel Asr		Vertical Steel Asv		Ring Steel Asr		Vertical Steel Asv		Ring Steel Asr		Vertical Steel Asv	
Tank Diameter	Bar Size	Spacing	Bar Size	Spacing	Bar Size	Spacing	Bar Size	Spacing	Bar Size	Spacing	Bar Size	Spacing	Bar Size	Spacing	Bar Size	Spacing
30 ft.	#4	12"	#4	12"	#4	12"	#4	12"	#4	9"	#4	11"	#4	8"	#4	11"
45 ft.	#4	12"	#4	12"	#4	10"	#4	12"	#4	9"	#4	11"	#4	7"	#4	11"
60 ft.	#4	12"	#4	12"	#4	8"	#4	11"	#4	6"	#4	10"	#5	8"	#5	12"
75 ft.	#4	12"	#4	12"	#4	8"	#4	10"	#4	6"	#4	8"	#5	7"	#5	10"
90 ft.	#4	8"	#4	12"	#4	7"	#4	9"	#4	6"	#4	8"	#5	7"	#5	9"
105 ft.	#4	8"	#4	12"	#4	7"	#4	8"	#5	8"	#5	9"	#5	6"	#5	8"
120 ft.	#4	6"	#4	12"	#4	6"	#4	8"	#5	8"	#5	9"	#5	6"	#5	7"

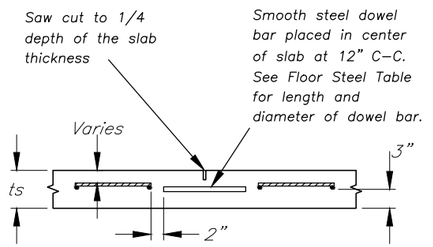
1. For tank sizes not listed, use the steel spacing and wall thickness from the next larger tank size (maximum height is 14 feet; maximum diameter is 120 feet).
2. Ring steel shall be located along the wall centerline.
3. Place vertical steel on the outside of the ring steel. Reference MidWest Plan Service, Publication TR–9 "Circular Concrete Manure Tanks (March 1998)" (Table 8).
4. See TR–9 for alternative ring steel placement (Tables 4, 5, 6, and 7).



WALL TO RING FOUNDATION DETAILS



WATER TIGHT CONSTRUCTION JOINT



S–3 CONTRACTION (CONTROL) JOINT

NOTES

1. Use a Type S–3 Slab for the floor (as described in the NRCS–Ohio Design and Construction Specification "Concrete") with the requirements as shown in the Floor Steel table on this sheet.
2. Contraction (control) joints shall be sawed to a depth of 1/4 of the floor thickness. Contraction (control) joint spacing in the floor shall be based on the slab thickness and the steel selected for the floor (see Floor Steel table). All joints shall be sawed to create a rectangular grid in the floor slab (the longer side of each section, excluding the slab/footing joint, shall not be more than 1.5 times the length of the shorter side).
3. Steel reinforcement shall not extend across a contraction (control) joint.
4. Smooth lightly–oiled dowels shall be used as shown in the Floor Steel table. Dowels shall be in the center of the floor slab and be spaced at 12" C–C.
5. Dowels shall not be in contact with the floor slab steel.
6. Dowels shall be parallel to the floor slab and perpendicular to the joint.

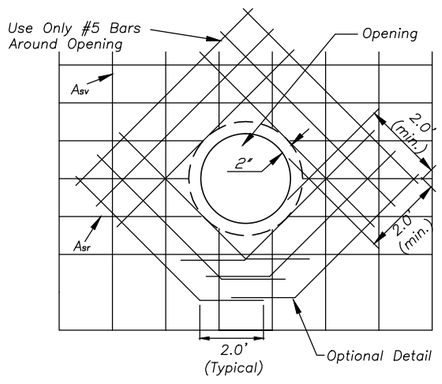
TYPICAL FLOOR DETAILS

FLOOR STEEL for Type S–3 Slab

(Ref. Ohio Design & Construction Spec. "Concrete", Table 1)

Control Joint Spacing *	Steel Selections	Slab Thickness ts	Dowel Bar Sizes
20 ft.	#4 @ 12" C–C	5.5 in.	3/4" x 13"
30 ft.	#4 @ 9" C–C		3/4" x 13"
40 ft. >	#4 @ 7" C–C		3/4" x 13"
20 ft.	#4 @ 11" C–C	6.0 in.	3/4" x 13"
	#5 @ 12" C–C		3/4" x 13"
30 ft.	#4 @ 8" C–C		3/4" x 13"
	#5 @ 12" C–C		3/4" x 13"
40 ft. >	#4 @ 6" C–C		3/4" x 13"
	#5 @ 10" C–C		3/4" x 13"
20 ft.	#4 @ 10" C–C	6.5 in.	3/4" x 13"
	#5 @ 12" C–C		3/4" x 13"
30 ft.	#4 @ 7" C–C		3/4" x 13"
	#5 @ 11" C–C		3/4" x 13"
	#6 @ 12" C–C		3/4" x 13"
40 ft. >	#4 @ 6" C–C		3/4" x 13"
	#5 @ 9" C–C		3/4" x 13"
	#6 @ 12" C–C		3/4" x 13"
20 ft.	#4 @ 9" C–C	7.0 in.	1" x 16"
	#5 @ 12" C–C		1" x 16"
30 ft.	#4 @ 7" C–C		1" x 16"
	#5 @ 11" C–C		1" x 16"
	#6 @ 12" C–C		1" x 16"
40 ft. >	#4 @ 5" C–C		1" x 16"
	#5 @ 8" C–C		1" x 16"
	#6 @ 12" C–C		1" x 16"

* 40 ft. > is a joint spacing that equals or exceeds 40 ft.

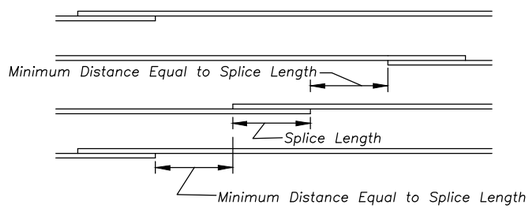


1. Cut all vertical and ring steel 2 inches from opening.
2. For each ring steel bar interrupted by the opening, install one #5 bar around each side of the opening. A minimum of 2– #5 bars are to be used along each side.
3. Bar spacing shall not be closer than 3 inches C–C and not farther apart than Asr spacing.

DETAIL OF PIPE PROTRUDING THROUGH A WALL

SPLICE LENGTHS FOR ALL BARS

Bar Size	Min. Splice Lengths
#4	16 inches
#5	19 inches



SPLICING DETAIL FOR WALL AND FOOTING RING STEEL

Date
Designed
Drawn
Checked
Approved

CIRCULAR CONCRETE MANURE TANK
Plan, Construction Notes & Quantities

County, Ohio
Location –

United States Department of Agriculture
Natural Resources Conservation Service

File No.

Drawing No. OH–N–506–CAD

Sheet of